PRODUCT CATEGORY BROCHURE

WXC SERIES APPLICATION ACCELERATION PLATFORMS AND WX CLIENT

Accelerating Application Delivery in the High-Performance Business

As an IT manager, you have every right to be concerned. After all, you're responsible for two seemingly contradictory goals: increasing employee productivity and reducing the cost of running the business. On the one hand, you're expected to provide consistent application performance across your geographically dispersed business for all employees (headquarters, branch office, remote), as well as suppliers, manufacturers, and contractors. Your business runs on these applications and by improving overall performance, you help the people who use them every day do more meaningful work in less time, improving productivity and making your business more competitive.

At the same time, you're also expected to implement strategic cost-cutting initiatives such as centralizing servers and Web-enabling existing client-server applications. Consolidating these resources into a single data center greatly simplifies system administration, management, and regulatory compliance, and can also dramatically reduce costs.

Challenges

Herein lies the dilemma. While resource consolidation can help you achieve your cost-cutting goals, it often does so at the expense of application performance by placing more pressure on existing data center and WAN resources.

For instance, while Web-enabled applications reduce client software support costs, they also create a capacity crunch on the WAN, since Web-based applications are nowhere near as bandwidth-efficient as their client/server counterparts. Buying more bandwidth is an option, but that will drive up costs and won't fix all of your problems. The distance between the data center and remote and branch-office users imposes application-killing latency—a fact that all the bandwidth in the world can't overcome. Any global business that has extended its centralized business applications to distributed branch office and remote users has learned that latency is the number one cause of poor application performance.

Regulatory compliance adds another dimension to the challenge. Making sure that email, files, and other data are retained isn't easy, given the disparate devices currently installed at far-flung locations. In short, you're faced with a compliance and application performance challenge that requires a strategic, proven, and straightforward solution, one that gives remote and branch office users the same response times they get from local servers. You also deserve a set of tools that provide a holistic view of the distributed enterprise and the applications running over it. Your WAN services and application licenses cost a lot of money, so understanding exactly how these strategic assets are performing is absolutely critical.

Trends

A number of trends and environmental changes threaten to transform the distributed enterprise from a strategic asset into a potential liability. These trends and changes are legitimate responses to evolving business needs. And because they have occurred over time, they have resulted in a patchwork of solutions that have added complexity to the environment.

Globalization and Distributed Applications

To remain competitive in an increasingly global business environment, organizations have established branch offices in locations around the world. In order to give their branch office staffs the same level of application performance as corporate headquarters, companies have created mini data centers at each branch, deploying application, file, and email servers at these remote sites.

While this resource proliferation gets the job done, it also has several serious drawbacks.

- It drives up capital costs, because the only way to keep pace with corporate expansion is to buy and deploy servers on an as-needed basis, making it impossible to leverage economies of scale.
- Deploying equipment at remote locations requires IT personnel for maintenance and support, increasing headcount and adding operational costs.
- Deploying applications in this distributed manner makes end-to-end management, backup, and recovery virtually impossible. A lack of visibility into remote locations also makes troubleshooting and problem resolution more difficult, affecting both availability and productivity.
- Security is also an issue; as device counts climb, so does the potential for a security breach.

Web-Enabling Business Operations

Similar resource proliferation is occurring in the data center, though for different reasons.

- As the Internet became a strategic corporate productivity tool, IT execs added a "Web tier" that initially consisted of Web servers in front of their centralized application servers to support Web-based versions of their business applications. These Web-based applications not only provided universal access to all employees, they also reduced costs by centralizing operations and eliminating the need to install and support client software on individual user desktops.
- As dependence on these Web-enabled applications grew, however, the Web tier expanded to include server load balancers (SLBs), SSL accelerators, cache appliances, authentication servers, and other equipment to keep the applications running smoothly for the swelling ranks of users.
- With each successive Web application deployment, complexity grew, driving up costs and impacting performance. Management became difficult, and the initial benefits of Web-based applications—universal access, centralized maintenance, and support—were compromised.

Data Center Consolidation and Application Acceleration

On the heels of these changes, IT is now being tasked with a number of new initiatives to curb costs and regain control over the ever-expanding enterprise.

To satisfy this objective, many organizations are eliminating their distributed branch office data centers and centralizing servers in one or two locations. This centralization saves considerable cost by reducing the number of servers required to support the workforce, eliminating the need for local IT personnel, and simplifying system management.

Unfortunately, these solutions also subject the distributed enterprise to even greater stress by forcing application sessions to run over notoriously slow wide area links. The result is poor application performance and response times for remote, mobile, and branch office users – the very problem the distributed data centers were designed to avoid.

In short, data center consolidation and server centralization has presented IT managers with a whole new set of challenges, including:

- **WAN Capacity:** WAN links offer limited bandwidth, and this is a considerable handicap as users attempt to send more rich content across the distributed enterprise. Web-enabling conventional applications exacerbates the problem by consuming at least 10 times more bandwidth than traditional client/server applications. New application rollouts—inevitable in any large organization—consume even more. With the pressure on to constrain costs, IT managers can't expect to buy their way out of this problem with additional bandwidth.
- **Latency:** Latency is the silent killer of applications. Chatty protocols such as TCP, HTTP, and HTTPS, as well as delay-sensitive solutions such as VoIP and the protocols used by applications such as Microsoft Exchange and Microsoft file services, are significantly impacted by even modest latency on wide area links. The result is poor response times for users.
- **Availability:** Without a connection to the data center and the rest of the enterprise, work simply stops. Creating an application-fluent infrastructure that understands the content and transactions at Layers 4 through 7 is an absolute necessity to delivering transaction completeness. Equally necessary in the always-on workplace are multiple paths connecting branch office and remote users to ensure business processes continue uninterrupted.

- **Contention:** According to a recent survey, enterprise IT managers are running more than 100 applications across their WAN connections. Approximately one-quarter of these applications are considered business-critical. When these applications compete for a fixed amount of bandwidth, all of them suffer.
- **Security:** Nearly 60 percent of today's workforce operates outside corporate headquarters. These employees need secure access to business-critical applications and other centralized resources. In many cases, secure access must also be extended to "outsiders" such as customers and business partners.
- **Manageability:** You can't manage what you can't see. If IT managers don't know what's happening across the distributed enterprise, they can't see clearly how to improve performance. Historically, monitoring and reporting application performance on the WAN has been difficult to do on a corporate IT budget. With application licenses, WAN services, and headcount consuming most of the budget, it's time for a better solution.

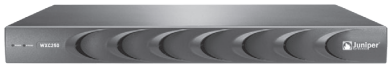
Addressing Enterprise Initiatives

Each of these challenges impacts the major initiatives facing IT managers today. These initiatives, which essentially define the evolving enterprise, include the following:

- **Web-enabling:** Off-the-shelf (SAP, Oracle) and custom-developed client/server business applications to lower branch office management costs and simplify connections by replacing private lines with virtual private networks (VPNs).

  This application migration, however, raises a number of security, bandwidth, and transaction completion issues. While client/server applications use proven methods to ensure that transactions have been completed successfully, the Web-enabled versions lack any such technique. Plus, they may be accessed over the public Internet, presenting security and capacity problems.
- **New applications:** Continually deployed both to reduce costs and to deliver new capabilities to end users. VoIP, for example, represents a cost-effective communication tool, while Microsoft's SharePoint and converged applications such as combined voice/Instant Messenger (IM) are being used to enhance collaboration.

  Applications like VoIP, however, have special requirements such as extremely low latency, jitter, and loss. As congestion grows, VoIP calls could be dropped, making it absolutely critical for IT to set and enforce quality of service (QoS) policies, and closely monitor activity on WAN connections.
- **Server centralization**: While an effective cost-cutting initiative, server centralization also presents performance issues for users accessing centralized applications from remote sites. IT must be able to guarantee sufficient performance for remote users, and understanding how WAN links behave, and how applications perform over these links, is critical.
- **Regulatory compliance:** Simply put, it's difficult for IT to gather and retain email and data for the required length of time if the enterprise is a patchwork of diverse devices and point products distributed around the globe.
- **Data replication:** As businesses establish backup data centers farther away from the primary location, they are typically unable to deliver the high-bandwidth, low-latency services that permit the continuous replication of data that is so critical to disaster recovery and high availability. Enterprises must overcome this obstacle to avoid data loss and enable smooth cutover in the event of a disaster.



WXC250

WXC1800

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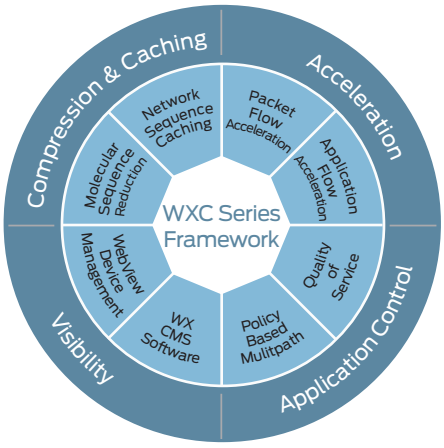


Juniper Networks Application Acceleration Solutions for the Distributed Enterprise

Juniper Networks® WXC Series Application Acceleration Platforms and WX Client give IT managers a holistic solution to problems in the data center and on WAN links, as well as a cost-effective way to comply with new corporate initiatives—without sacrificing performance across the distributed enterprise.

The WXC Series Family: Overcoming WAN Limitations

Server centralization leaves branch office employees at the mercy of the WAN when it comes to application performance. The WXC Series Application Acceleration Platforms accelerate mission-critical applications over wide area links, making branch office users feel local again. The product family includes the WXC250, WXC1800, WXC2600, WXC500, WXC590, WXC3400, and the WXC Stack. Each provides the full feature set and runs the same WXOS software. WXC Series products provide a range of compressed output, from 2 Mbps to 155 Mbps rates. They also differ in the number of remote sites they can link to, ranging from two to 840. Multiple communities of WXC Series devices can be configured to support an unlimited number of locations.

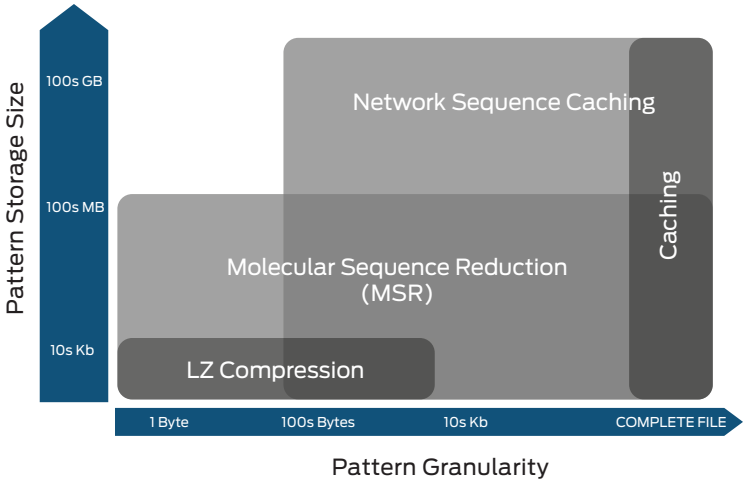
The WXC Series Framework

The WXC Series Framework is unique in that it delivers the full complement of capabilities needed to enhance every aspect of the global enterprise:

- **Compression and caching:** To reduce the amount of data actually flowing across wide area links by eliminating redundant data patterns and boosting connection capacity to accommodate a greater volume of traffic
- **Acceleration techniques:** To speed the performance of specific applications and protocols over the WAN, cutting response times and optimizing traffic flows to deliver a more LAN-like experience for remote office users
- **Application control:** QoS, bandwidth management, and Policy-Based Multipath features ensure that applications make the most efficient use of available links and bandwidth to optimize performance and prioritize mission-critical data traffic
- **Visibility into WAN links and application performance:** To enable IT to understand how all WAN endpoints are performing, providing the information needed to make informed capacity planning and configuration decisions, as well as to quickly detect, isolate, and resolve performance problems

Real-World Benefits

WXC Series Framework capabilities help IT professionals overcome their toughest wide area challenges. Molecular Sequence Reduction (MSR) compression technology, for instance, reduces application data flows across WAN links by 60 to 75 percent, which translates into a capacity increase of up to four times. This "extra" capacity can be used for new application rollouts without having to invest in additional bandwidth. The Network Sequence Caching technology, which uses hard disks to store larger data patterns for longer periods of time, reduces traffic flows up to 99 percent—a 50 to 100 times capacity increase—again, without having to re-provision a single link.



Increased Bandwidth: The Sequence Caching and MSR technologies benefit different traffic types in their compression and caching capabilities. Both provide far broader advantages than file caching or traditional compression.

Acceleration techniques boost application response times at branch offices by 5 to 10 times on average. Working with generic protocols such as TCP and specific applications such as Microsoft Exchange (MAPI), Microsoft File Services (CIFS) and Web servers (HTTP/HTTPS) and SSL, the WXC Series brings performance gains of up to 100 times—more than sufficient to justify the centralization of critical application servers.

QoS assures application delivery by effectively managing bandwidth and establishing and enforcing prioritization policies. Business-critical and delay-sensitive applications always get the bandwidth they need, without interfering with other applications. And Juniper's Policy-Based Multipath technology lets IT assign application traffic to specific links when more than one is available, providing an additional level of control to assure effective application delivery.

WXOS Operating System Software

The WX Operating System (WXOS) software is the foundation of the Juniper Networks WXC Series Application Acceleration Platforms. Supporting the interdependent technologies of the WXC Series Framework that provide powerful compression, caching, acceleration, application control, and visibility for the WXC Series products, the WXOS software enables LAN-like application delivery across the WAN.

WX Central Management System (WX CMS) Software

One of the most critical issues to address in WAN optimization is visibility into an enterprise's distributed network and applications. All too often, IT does not have—and cannot get the budget to buy—the tools needed to really understand what is traversing the WAN. More than any other single feature of the WXC Series Framework, the WX CMS software is tightly woven into every other function, providing IT with aggregated reporting of WAN and application performance, and control over the parameters that affect business policies.

The WX CMS software provides the following benefits for any deployment of multiple WXC Series platforms:

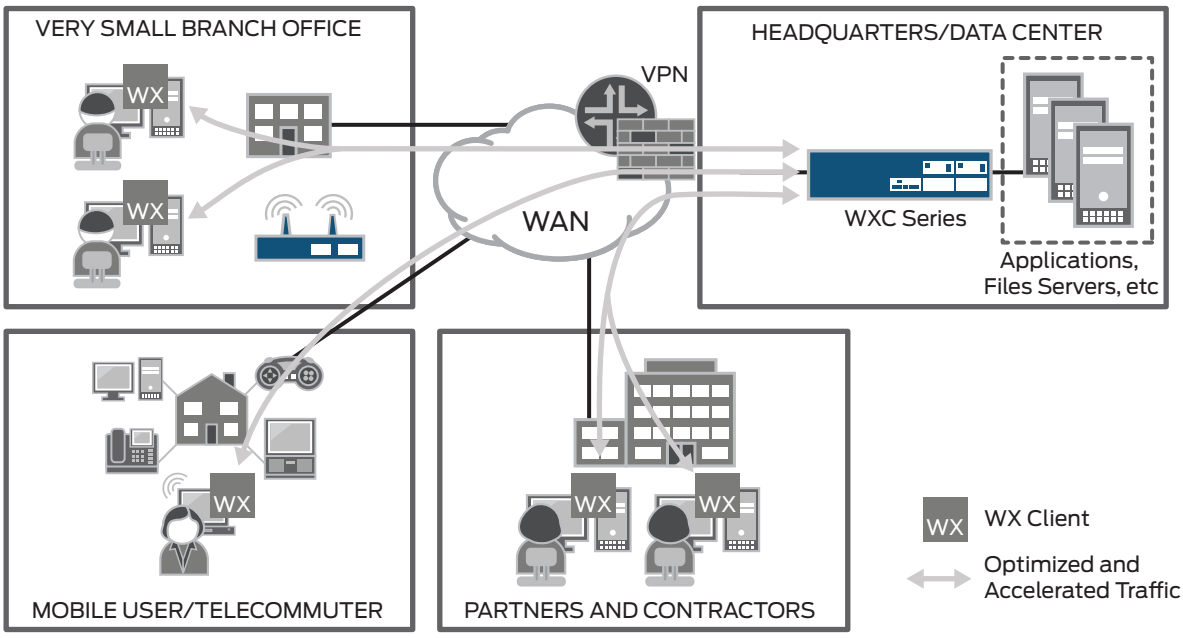
- **Visibility into WAN applications and performance, with unique customizable portal:** The WX CMS software gives IT a complete view into what is happening on their WAN with deep visibility on applications distribution, performance, optimization and health.
- **Centralized and simplified configuration:** The WX CMS software creates a single location from which to manage and monitor as many as 2,000 WXC Series platforms.
- **Global policies and monitoring:** The WX CMS software allows network managers to centrally manage and modify global configuration settings on all WXC Series platforms. IT can also monitor the distributed platforms, with status reports providing at-a-glance summaries of device health, configuration status, and data on compression, sequence caching, and acceleration results.
- **Content distribution:** The WX CMS software allows IT to selectively pre-populate distributed WXC Series devices with large files, providing content delivery network (CDN)-like capabilities without actually deploying a dedicated CDN solution.
- **Automated deployment and license management:** Using the WX CMS software, IT can automate configuration and license management of remote WXC Series platforms, greatly simplifying the set up of tens or hundreds of distributed platforms.
- **Simplified problem resolution:** The WX CMS Event Management Console provides a summary of system and performance events, enabling IT to proactively find and resolve network problems. The system can be configured to send email alerts when events are detected for more rapid resolution.

The WX CMS software runs on Microsoft Windows 2000 and 2003 servers and can be accessed securely from any browser connection via HTTPS.

WX Client: Application Acceleration for mobile users and small offices

The WX Client provides a completely transparent and cost-effective way to boost the productivity of mobile and small office users.

Easy to install and requiring little or no end user intervention, the WX Client is a Windows-based desktop application (Windows 2000 and XP) that works transparently in the background without interfering with other applications such as IPsec/VPN and personal



WX Client deployment scenarios

firewalls that may be installed on the end user's machine. The WX Client improves application performance over the WAN by recognizing and eliminating redundant transmissions, and accelerating TCP and application-specific protocols.

The WX Client is unique in the industry because of its integration with Juniper Networks SA Series SSL VPN Appliances. A key challenge for IT administrators in deploying software on hundreds or thousands of end user machines is managing the distribution of the software and maintaining software version control. Juniper solves this by integrating the WX Client with the SA Series; when a user connects to their

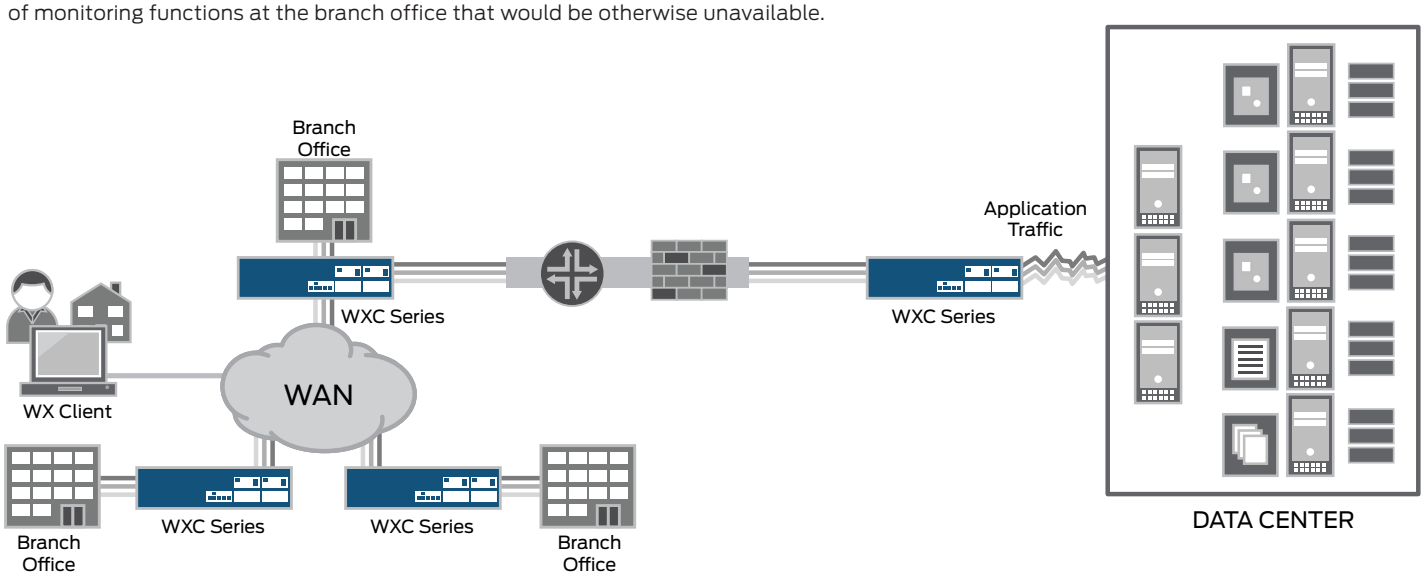
SA Series appliance, the WX Client is auto-installed on the end user's machine and for all subsequent SA Series sessions, a check is performed by the SA Series appliance to determine if the WX Client software and configuration version is current. Also most software clients must be manually started to accelerate traffic, which in turn requires that the end user remembers to start their software client when they are remote. Juniper solves this in its integrated solution with a WX Client that can be automatically started once the end user's SA Series connection is established.

Combining the WX Client with SA Series products provides automated download and WX Client management via a feature rich authentication and policy platform, providing IT administrators with a simple way to ensure that all remote end user traffic is both secure and accelerated.

Integration Advantages

Through the integration of advanced capabilities in the WXC Series, IT can proceed with server centralization and data center consolidation initiatives to simplify network architecture and reduce capital outlays. WXC Series platform deployment is completely automated, so no IT expertise is required at the branch office when a new platform is installed. Local users simply power the device and connect it to the network; the platform takes it from there, downloading and installing the necessary configuration data from a WX Central Management System (WX CMS) server at the central location.

Finally, because the WCX Series platforms are deployed symmetrically, with one at each end of the wide area link, they are in a perfect position to monitor and assess exactly how applications are performing over the WAN. IT managers gain full visibility into WAN links between the data center and branch offices; in some cases, the IT staff can take advantage of monitoring functions at the branch office that would be otherwise unavailable.



WXC Series reduce application traffic on the WAN, opening up capacity and improving response times for remote and branch-office users.

JUNIPER NETWORKS SERVICE AND SUPPORT

Juniper Networks is the leader in performance-enabling services and support, which are designed to accelerate, extend, and optimize your high-performance network. Our services allow you to bring revenue-generating capabilities online faster so you can realize bigger productivity gains and faster rollouts of new business models and ventures. At the same time, Juniper Networks ensures operational excellence by optimizing your network to maintain required levels of performance, reliability, and availability. For more details, please visit **www.juniper.net/us/en/products-services/.**

Planning, Implementation, and Deployment

The WXC Series products integrate seamlessly with existing LAN and WAN designs and operate fully transparently, independent of other network equipment, applications, servers, clients, and WAN topology and interfaces. WXC Series devices are deployed at both ends of a WAN link, enhancing the WAN and application knowledge of each.

IT can place a WXC Series platform either directly in the flow of traffic between a LAN switch and WAN router or attach it to a port on the switch or router. This off-path deployment option provides IT the flexibility required to support LANs designed with collapsed backbone switch/routers or with so many redundant connections among the LAN switch and WAN router that inline deployments would be impractical.

The WXC Series provide a number of redundancy, high-availability, and load-balancing features. All data center WXC Series products include redundant power supplies, and all WXC Series platforms support fail-safe operation. In the event of a failure of any kind, including total loss of power, the WXC Series interfaces automatically convert to a bypass mode in which all traffic simply passes through the device untouched.

WXC Series platforms operate in communities that dynamically exchange information such as topology, reachability, and path performance metrics, providing IT with distributed stateful intelligence about local and wide area network conditions. IT also has the option to partition large WXC Series deployments into separate domains, increasing operational scalability.

WXC Series devices support a multitude of redundant deployment modes. WXOS software works with routers configured with redundancy protocols, and WXC Series can also be deployed in tandem at a single location, with both platforms active or with one in standby mode. WXC Series devices also work effectively alongside VPN servers or firewalls. The WXC Series sit on the trusted side of the security device and optimize traffic before it is encrypted, avoiding any conflict with the security devices.

In contrast to many WAN optimization platforms that involve cumbersome configuration, the WXC Series are fast and easy to install. Central devices can be configured within 10 minutes, and IT can use the WX CMS software to automate deployment of devices at remote locations, which typically have no local IT staff. Corporate IT simply defines centralized configuration templates and notes which locations will use them. At boot up, remote WXC Series automatically obtain a network address, locate the WX CMS server through the Domain Name System (DNS), request configuration from the WX CMS server, download the appropriate configuration file, and begin operation.

IT can also use the WX CMS software to monitor and manage multiple WXC Series devices as a group, or they can use the embedded secure WebView or command-line interface (CLI) to manage each device separately. WXC Series products are available in a range of capacities to meet the needs of various sizes of enterprise locations.

Summary

With application acceleration, high-performance businesses are figuring out that they no longer need to make a significant compromise between IT and user requirements. In fact, discriminating organizations are going a step further by recognizing the added long term benefit of making an application acceleration solution part of a broader high-performance network driven strategy.

The Juniper Networks WXC Series Application Acceleration Platforms and WX Client deliver best-in-class application delivery across the wide area network, restoring global networks to their rightful place as a strategic business tool. By simultaneously targeting both the data center and the WAN, Juniper's application acceleration platforms deliver fast and consistent application response—ensuring uncompromised access to mission-critical applications and services. They enable IT managers to make the most efficient use of existing resources while radically simplifying the data center and branch-office architectures, streamlining applications, and delivering unprecedented visibility into network performance. Finally, for the high performing enterprise, WXC Series Application Acceleration Platforms and WX Client enable IT to achieve the greatest success in meeting business goals by providing:

- Fast, consistent, and uncompromised access to important applications and services across the WAN
- Broad application support
- Performance and scale to support large application deployments
- A comprehensive management system for central management, monitoring, and troubleshooting
- Flexible application acceleration deployment
- Solutions that build competitive advantage

The WXC Series Framework provides the foundation for the WXC Series Application Acceleration Platforms, making it easy and cost-effective for IT to provide the enterprise-class application acceleration and delivery needed to support new applications and branch office access to centralized resources.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at **www.juniper.net.**

Corporate and Sales Headquarters
Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or 408.745.2000
Fax: 408.745.2100
www.juniper.net

APAC Headquarters
Juniper Networks (Hong Kong)
26/F, Cityplaza One
1111 King's Road
Taikoo Shing, Hong Kong
Phone: 852.2332.3636
Fax: 852.2574.7803

EMEA Headquarters
Juniper Networks Ireland
Airside Business Park
Swords, County Dublin, Ireland
Phone: 35.31.8903.600
EMEA Sales: 00800.4586.4737
Fax: 35.31.8903.601

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